IN THE CLAIMS

1. (Previously Presented) A piston pumping system comprising a piston guided within a guide tube and capable of performing a stroke movement along its longitudinal axis, opening into a pumping chamber, the pumping chamber being connected via a liquid-conveying connection with valve to a storage vessel and from the pumping chamber a liquid conveying connection leads to a device for delivering the liquid, wherein the guide tube is formed an O-ring seal held by a groove which seals off the piston, has a gas permeation coefficient of 100 to 500 $N*cm^3*mm/(m^2*h*bar)$ for nitrogen (N_2) and a radial compression of less than 30% and the seal fills the groove with a groove filling level of more than 90%.

2. (Original) A piston pumping system according to claim 1, wherein the groove filling level is more than 95%.

3. (Original) A piston pumping system according to claim 1, wherein the valve is a non-return valve.

4. (Original) A piston pumping system according to claim 1, wherein a non-return valve is formed in the connection to a device for delivering the liquid.

5. (Currently Amended) A piston pumping system according to claim 1, wherein the piston has a ~~eross section~~ diameter of 0.25 to 4 mm.

6. (Original) A piston pumping system according to claim 1, wherein the piston has a length of 5 mm to 10 cm.

7. (Original) A piston pumping system according to claim 1, wherein the stroke movement of the piston along its longitudinal axis covers a length from up to 1 mm to 5 cm.

8. (Original) A piston pumping system according to claim 1, wherein the O-ring seal consists of silicon.

9. (Currently Amended) A piston pumping system according to claim 1, wherein the piston is a hollow piston in which the liquid-conveying connection with a valve, which connects the pumping chamber to a storage vessel, is integrated.

10. (Original) A piston pumping system according to claim 1, wherein the movement of the piston is mechanically controlled.

11. (Previously Presented) A piston pumping system according to claim 10, wherein the piston is moved by a helical spring.

12. (Original) A piston pumping system according to claim 1, wherein the movement of the piston is electronically controlled.

13. (Previously Presented) A piston pumping system according to claim 12, wherein the piston is controlled by a microchip.

14. (Previously Presented) A piston pumping system according to claim 12, wherein the piston is moved by a piezoelectric element.

15. (Original) A piston pumping system according to claim 1, wherein the pump volume is from 1 microlitre to 1 ml.

16. (Original) A piston pumping system according to claim 1, wherein the device for delivering the liquid is at least one nozzle, at least one micro-pin or at least one microcutter along which the liquid is guided, at least canulas and/or at least one outlet.

17. (Original) A piston pumping system according to claim 1, wherein the cord thickness of the O-ring is from 0.3 to 3 mm.

18. Canceled.

19. Cancelled.

20. Cancelled.